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AMERICAN Cinematographer

*International Journal of Motion Picture
Photography and Production Techniques*

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ARRIFLEX at work — ONE OF A SERIES*



THE SIMPLICITY OF THE ARRIFLEX-35 OPERATOR IS ILLUSTRATED BY CAMERAMAN NOLLY BARRUS, TO BRIGHAM YOUNG UNIVERSITY'S HEAD COACH, RAL NICHOLS.

Five seasons of filming football games with an Arriflex 35, with never a lost play due to mechanical malfunction, is the proud report of Nolly Barrus, official cameraman for Brigham Young University, Provo, Utah.

Selected to eliminate the failings of previous equipment,

Arriflex has lived up to its reputation for performance and dependability. In filming sports events particularly, there is no chance for missing footage lost through mechanical failures or cumbersome equipment. "In this respect," Barrus says, "Arriflex is a joy!" Lightweight, portable and engineered for one-man operation, it helps the photographer "stay on top" of every play. The reflex view-finder permits fast through-the-lens composition and makes follow-focus easy — no

ARRIFLEX® scores in every game at Brigham Young U.

matter how deceptive the quarterback, Arriflex's exclusive 21°-divergence 3-lens turret saves time, too — permits side-by-side mounting of long and short lenses — switch from telephoto to wide angle without mechanical or optical interference!

So satisfactory did the Arriflex prove itself, both on campus and away, that the University acquired two more for its Motion Picture Department and to record other collegiate activities.

Summing up the general reaction, Cameraman Barrus states, "In my opinion, Arriflex is the best 35mm camera available today." Whatever your need — in industry, science or entertainment — filming sports or satellites, you will come to the same conclusion.



From the microscope to the missile range... from spot locations to sound stages... Arriflex professional motion picture cameras are the dominant choice of filmmakers in science, industry, and entertainment. They're lightweight, rugged, tremendously versatile — uniquely suited to a range of applications virtually without limits. Here are some of the features that give Arriflex cameras their remarkable capabilities:

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AMERICAN

Cinematographer

INTERNATIONAL JOURNAL OF MOTION PICTURE
PHOTOGRAPHY AND PRODUCTION TECHNIQUES

APRIL, 1963

Vol. 44, No. 4

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ON THE COVER

WHAT THE WELL-DRESSED cameraman may wear is most of a future attack attack
Protected from radiation exposure is his "half-suit" outfit, an Air Force cleanroom
plus prepared to photograph an atomic detonation during another testing program
conducted in Nevada desert recently—APCS Photo

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HOLLYWOOD 7-2125. EASTSIDE ADVERTISING REPRESENTATIVE: Paul Gilbert, 489 Park Avenue,
New York 17, N.Y. Telephone AL 7-5441.

AMERICAN CINEMATOGRAPHER established 1939, is published monthly by the A. S. C. Holding
Corp., 1762 N. Orange Dr., Hollywood 28, Calif. SUBSCRIPTIONS: United States and Canada
\$5.00 per year; Foreign, including Pan American Union, \$6.00 per year. (Renew by International
Money Order or other exchange payable in the U.S.) Single copies 50 cents; back numbers 60
cents; foreign single copies 60 cents; back numbers 75 cents. Advertising rates on application.
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INDUSTRY NEWS

News briefs of industry activities, products and progress



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Studio Plans Aid For Aspiring Filmmakers

Universal studios has announced it is stepping up its new talent development activities and has launched a program to find, develop and encourage fresh, new young talent—actors, writers, directors, producers—as well as to consider worthy filmmaking projects by outsiders for which financing is needed.

To provide opportunities for these newcomers to express themselves in actual creation of motion pictures rather than in any training program, Edward Muhl, Vice-president in charge of production at Universal said the company has allocated a substantial budget for the production of a number of such motion pictures.

The program also is open to those critics contending that young American picture-makers have not kept pace with the recent "new wave" or neo-realist school of producers abroad. Muhl points out, and says it will tackle in a concrete and practical manner the problem of developing major new picture-making talent behind the camera as well as the performing artist. (See "The Pros Show The Students How," *American Cinematographer* for February, 1963.—ED.)

Unions Plan Saving Rules To Aid Indie Filmmakers

The IATSE, whose union rules govern all professional film making in Hollywood, is considering easing its working rules with non-theatrical film producers "to benefit them via smaller crews, etc." Move is disclosed as part of long range plan of IATSE to put the production of non-theatrical films, especially those for the U. S. government, into professional hands.

Regarding the latter, a spokesman said that organized film centers in the U.S. find it impossible to obtain government film contracts except in a very limited degree. Hiring of a Washington D.C. research group is planned to determine how much expenditures for films are contained in governmental prime contracts, the in-house film pro-

duction capabilities of various government agencies, and to analyze the film bid procedures of the agencies with the object of formulating a policy that will make it possible for experienced film-makers to bid on government motion picture requirements.

G-E Develops Large-Screen Color TV For Theaters

Development of a light valve projector which for the first time makes possible display of color television images covering theater-size screens, was announced recently by General Electric.

The large-screen capability of G-E's new Talenta projector is expected to have important implications for the entertainment industry, as well as for education (particularly medical education), military and business communications.

Until perfection of the projector by G-E's Technical Products Operation, Syracuse, N.Y., display of TV pictures on full size (25 by 35-foot) screens with adequate brightness was limited to black-and-white. Previously most color systems were limited to screens about one-fourth this size and thus were impractical for large audiences.

The Talenta system reportedly is capable of producing a wider gamut of colors than the best color film available because color is determined by optical filters rather than dyes. Resolution, or amount of detail, is about 500 TV lines, better than home TV receivers. Uniformity of illumination is excellent. Illumination at the edges of the Talenta picture falls to 70 per cent of that at the center. SMPTE standards allow a drop to 60 per cent.

UCLA Grad Wins Screen Gems Film-Making Fellowship

James D. Worthing, 25, Phi Beta Kappa UCLA graduate student in the radio-TV division of the theater arts department, has won the \$1500 fellowship given annually by Screen Gems, major producer of TV films. He will spend five months at Screen Gems studio in Hollywood as an apprentice to

Continued on Page 116



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John Flanagan, left, cameraman with Ray Babb, F & B's Chief Engineer, who developed the new Cine Voice Conversion.

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NATIONAL FILM EDITING SCHOOL
NEW YORK, N. Y.

INDUSTRY NEWS

Continued from Page 106

observe and engage in all phases of telefilm-making, from story conception to marketing.

The fellowship was established at UCLA in 1961. Previous winners John Rhoads and John Chey are now working in the industry, the former an associate producer at Screen Gems and the latter at Revue.

Solow Hollywood Delegate To Argentine Festival

Salvador P. Solow, Vice-president and General Manager of Consolidated Film Industries, represented the American Society of Cinematographers, the Society of Motion Picture and Television Engineers and the Cinema Department of the University of Southern California at the Mar del Plata Film Festival in Argentina last month.

Macauley Heads S.O.S.

Allen and Jan Macauley, husband-and-wife managerial team of S.O.S.'s Hollywood offices since 1955, have acquired a substantial stock interest in the company and Allen Macauley has been elected a Director of the company and also its new President.

Joseph A. Tansley, who has been President of S.O.S. since its founding 12 years ago, becomes Chairman of the Board. Other new officers of the Company are: Edmund J. Capone, Vice-president and General Manager; William H. Allen, Engineering Vice-President and Secretary; and Jan T. Macauley, Treasurer. Mr. Capone and Mr. Allen have each been with the Company for over 25 years.

Claude C. Pitts has been engaged as Sales Engineer with headquarters in the Hollywood Office. He brings with him a varied experience, including 20 years with the Photographic Branch of the U.S. Navy, as well as associations with the motion picture groups of Boeing and General Dynamics-Corvair.

Camera Men Seeliger Speakers Announced

More than 21 executives and technical heads of various east coast film production companies are slated to participate as lecturers, instructors or panel speakers at the forthcoming Camera Man 1st Annual Film Editing

Continued on Page 246

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ACE Deluxe 16/35/13mm Mylar tape splicer, straight and diagonal, list \$120, ACE serrated edge mylar cutter bar \$5.00, both items brand new, special package price \$18.50

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WHAT'S NEW

IN EQUIPMENT, ACCESSORIES, SERVICES



Movie TV Matters

The Camera Mart Inc., 1645 Broadway, New York 23, N. Y., announces a newly designed TV matte for Movie film editing machines. Designed to eliminate guesswork in framing exact picture area as it is to be seen on home TV receivers, the Canary TV matte enables the film editor or sponsor of the film (or commercial) to preview the picture in the current TV frame size directly on a Movie picture head, illustrated above.

The matte is placed flat on the Movie viewing glass surface and is instantly removable. Precision cut and fitted from durable opaque plastic, it is available in three sizes to fit all 16mm and 35mm Movieks. Prices range from \$6.50 to \$8.00.

Sun Gun II

A new member of the Sylvaria Sun Gun family, claimed to have all of the effective light output of the original model, has had a number of features added for more versatility and convenience.

The Sun Gun II has a camera bracket fixed permanently to the unit and folds against the gun handle when not in use. Its removable head is connected to the handle by an adjustable locking knob, permitting the head to be tilted easily and quickly for bounce lighting. A head-angle indicator is included for accurate positioning of the light direction.

The new Sun Gun operates on or through household current. Its halogen lamp (DWY) is balanced for 3400 deg. K for use without filters with Type A color or black-and-white film. Also available is a 3200 deg. K lamp (FAD) for use with Type B color film.

A third version of the Sylvaria lamp (DXV), is designed for overseas use where 250-volt current is used. All three lamps are interchangeable, and can be placed in position quickly. Sylvaria Electric Products, Inc., 730 3rd Ave., New York 17, N. Y.

Magno-Tech Has Magno

Magno-Tech Electronic Co., Inc., 630 North Avenue, New York 36, N. Y., announces it is distributing and servicing the Magno portable tape recorder. The company maintains excellent servicing facilities and carries a stock of replacement parts for the equipment. A price list and specification sheet is available on request.

Angenieux Zoom Lenses

Zoomar International Inc., division of Zoomar Inc., Glen Cove, L.I., N.Y., announces its affiliation with Els Pierre Angenieux of Paris and Evered Power-Optics Ltd. of London to act as their Exclusive representative for the United States, Canada and South America. Through this affiliation Zoomar International Inc. will make available to North and South American film makers a particularly comprehensive range of standard zoom lenses as well as special optics. Zoom lenses can also be supplied with servo controls manufactured jointly by Els Pierre Angenieux and Evered & Vignoles Ltd., London. Of special interest are the Angenieux zoom lenses with a range from 1.10 for 16mm or 35mm movie cameras and for Orducon and Viducon TV cameras.



Stop-Watch For Film Makers

A new, specially designed stop watch for timing 16mm and 35mm film.

Continued on Page 200

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ARRIFLEX 35mm blimp with synchronous motor, value over \$2,500 used, exceptionally fine condition, special \$1,450.00

EYEMO model K camera, 2" F2.8 lens in focusing mount, drum 35mm, excellent \$375.00

AURICON blimp complete with synchronous motor for Cine Special camera, excellent, was \$400 Specially offered at \$295.00

REENDT MAURER professional camera, 2-480' mag, finder, sunshade, registration pin movement, pressure reloader, excellent, value over \$2,000 Special \$655.00

CINE VOICE sound camera, 100 capacity, turret, variable area prism, amplifier, mic, headset, cables, batteries, case, excellent, value \$1,200 Special \$725.00

B&H Films hi-speed 128 fps spring wind camera w/1 1/8 lens, excellent \$695.00

SPECTRA three color temperature meter complete w/case and set of 322 filters, value over \$400 Special \$195.00

MITCHELL 3000' x 35mm magazine, new, value \$100.00, special \$100.00

All prices F.O.B. New York

SEE PAGE 222 FOR PRICES LIST OFFER

the **CAMERA MART** inc.
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Gift Enclosures

WHAT'S NEW

Continued from Page 198

features large, easy-to-read numbers set in three different colors. The watch is shock proof, water resistant, dust resistant, anti magnetic, self compensating and has an unbreakable main spring. It is offered by Burns & Sawyer Cine Equipment, 6124 Santa Monica Boulevard, Hollywood 38, California.

Two models are available, a deluxe Studio model at \$24.95 and a Filmmaker model at \$15.95. Both come complete with a generous braided lanyard and carry a one year guarantee.



Reversal Processor

The Filmmine Corp., Milford, Conn. recently announces a new high speed film processor. Designed to meet the exacting requirements of the film industry, the new model R-45 can develop reversal or neg pos film at 1200 feet per hour. Among its many exclusive features are the Filmmine overdrive system, which eliminates film breakage automatically compensates for film elongation and keeps tank footage constant. A variable-speed drive allows control of development times from 1 1/2 to 12 minutes. A level is elevator and 1200' magazine permits continuous processing. All tanks are stainless steel. The R-45 has an air squeegee, removable film fittings, air agitation tube, lower roller guards and forced filtered warm air drybox. Easy-to-operate in unskilled personnel in daylight—no darkroom needed.

Additional features include: double capacity spray wash, uniform tank size construction, self controlled plumbing, ball-bearing gear box, oilless air compressor, dry box and developer thermometers. Size 77" x 60" x 30". Weight approx. 650 lbs. Priced at \$4750 complete. (Including Temperature Control System. Bottom drains and valves, developer recirculation and air compressor.)

Inspection Projector

Hollywood Film Company, 566 No. Seward St., Hollywood 48, Calif., announces a new, high-speed inspection projector for use by film laboratories to inspect release prints before they leave the lab. The projector is available in either 16mm or 35mm models and is mounted on a modern designed base which allows the operator to easily and quickly make height adjustments.

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BEHIND THE CAMERAS

WHAT THE INDUSTRY'S CAMERAMEN WERE SHOOTING LAST MONTH
BY PATRICIA KILGINS

NOTE: Accounts following refer to films released this production.

ALING ARTISTS

STANLEY CORNELL, ASC, "The Long Goodbye" (Leon Fendick Prod.) with James Best, Samuel Fuller, producer-director

PAUL VERUL, ASC, "The Gun Hawk" (Burt Ford Prod., color) with Rory Calhoun and Red Corcoran. Edward Ludwig, director

AMERICAN INTERNATIONAL

MARIO BAVA, "Black Sabbath" (Gelatone Prod., AFI, Eastman color) with Burt Reynolds and Mark Damon. Mario Bava, director

FLORA GORDY, ASC, "X" (James R. Killam/Samuel Z. Arkoff Prod., Farbe color) with Ray Milland and Diana Van der Vin. Roger Corman, producer-director

MURKIN STUDIOS, N.Y.

JACK PRINSTER, "Naked City"

NOGRAPH STUDIOS—New York

GEORGE SCOTT, ASC, "Car 54 Where are You?"

CASCADE STUDIOS

HENRY FARBUSH, ASC, "Cometcatcher"

KENNEDY BRIGGS, ASI, "Cometcatcher"

TYLER BEARS, "Cometcatcher"

CS—N.Y.

CHARLES MACK, LEO REIS, ROBERT CLIMBERG, "CBS Reports"

FRED ROYMAN, MIMI ZORNAIL, "Candid Camera"

SHAWN DUFFY, BOB GORDON, KEN SWANSON, "Twentieth Century"

WILL GIBSON, "CBS Sports Spectacular"

COLUMBIA STUDIOS

GE. TUCKER, "Dante's Sinisterplot" (Or Has I Learned to Stop Worrying and Love the Bomb?) (Trooper Films shooting in Europe) with Peter Sellen and George C. Scott. Stanley Kubrick, producer-director

JOHN SEAMON, ASC, ROSE LAWELL, "The Cockfield" (Gemma Prod., Farbe) with Tim Virts and James Schander. Gus Pennington, producer-director

STELLA MAIR, "Golden Gate to Rome" (Jerry Brinder Prod., Eastman color, shot in Rome) with James Darren and Cindy Carol. Paul Wendkos, director

JACQUES BEG, ASC, "Under the Yarn Yarn Tree" (Bronson Swift Prod., Eastman color) with Jack Lemmon and Carol Lynley. David Swift, director

CHRISTOPHER CHALICE, "The Long Ships" (Wayback Film Prods., Technicolor-Terbit color, shooting in Yugoslavia) with Robert Schenk and Sidney Poitier. Jack Cardiff, director

ANDREW ANGLIS, ASC, "Cometcatcher"

PAUL GATLEY, ASC, "Cometcatcher"

CHARLES WILSON, "Empire"

CONOR AVIL, ASC, "Cometcatcher"

JACK MARTY, "Route 66"

RONALD WYCHOFF, "Dance the Meanies"

CHARLES LAWTON, ASC, "Cometcatcher"

BENNY CUFFY, ASC, "Cometcatcher"

ROBERT HAWKINS, "Haggers"

DESMU—Columbia Studio

ELMER GONZALEZ, "The Jerry Seinfeld Show"

HENRY DEGRANGE, ASC, "Dick Van Dyke Show"

MARY GOODMAN, ASC, "Tim Buckles—He's Funster"

SEA HEDGECOCK, ASC, "The Andy Griffith Show"

DESMU—Cohen City

LOTHAR WERTH, ASC, "The Real Mc-Coy"

CHARLES SCHNEIDER, "The Unattachable"

DESMU—Gower

GLYN MACWILLIAMS, ASC, "Face It—Image"

MARY GOODMAN, ASC, "The Lucy Show"

LEE VOIGTLANDER, "The Casey"

FLUWATY STUDIOS—New York

MOSES HARTMAN, "The Defendants"

GENERAL SERVICE STUDIOS

LESTER SOKAL, ASC, "The Beverly Hills Cop"

ROBERT MORRIS, "Adventures of Ozzie & Harriet"

FRED NILES STUDIOS, N.Y.

SOL NIELSEN, "Universal Storybook" (Fred Niles Prods. in ATAT) Phil Goodman, director

INDIPEND

ALAN STERNBERG, ASC, "Harry's Las Vegas" (Producers Equity Corp.) UA release. Farbe color) with presence of Las Vegas show. Mitchell Leisen, director

WILLIAM MULLER, ASC, "The Grapes of Wrath Tell" (Cine, Standard Prod., UA release, PT/Vista & Cinema in Technicolor) with Mar Van Slyke and Charles Berton. George Stevens, producer-director


GEORGE HALL, "Stoney Burke" (Dipter),

FRANK LAWTON, ASC, "The Pink Panther" (Edwards Monash Prod., UA release, Super Technicolor 30 & Technicolor, shooting in Rome) with David Lee and Peter Sellen. Blake Edwards, director

JAC MACDONALD, ASC, "Kings of the Sea" (Miramax Prod., UA release, PT/Vista & Deluxe color) shooting in Mexico with Val Ripstein and George Chakos. J. Lee Thompson, director

ROBERT KRAUSS, "The Fall of the Roman Empire" (Samuel Bronston Prod.), Ultra PT/Vista & Technicolor, shooting in Spain with Sophia Loren and Stephen Boyd. Anthony Mann, director

Continued on Page 204



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Director David Lean in white hat, pointing, is directing Academy Award winning *Lawrence of Arabia* in hot sands of Jordan Desert. Birns & Sawyer equipped the 16-month production with the Academy

Motion Picture Research Council Grand and Worrell geared head shown in photo, which aided in a small way achieving the award for excellence in cinematography.

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BEHIND THE CAMERAS

Continued from Page 202

FENNY LAMON, ASC, "Thomas Vincent Park Story" (Fred Rose Prod.) with Dan Stryker and Don Hyland, Denis Sanders, director.

JAMES V. MARVELL, "The Incredible Shrinking Creature: as Why I Stopped Living and Became a Mixed up Zander" (Hagson-Schickler Prod., Eastman color) with Cash Flagg and Carolyn French, Ray Dennis Steckler, director.

FALCON SAYS "Columbo" (Cen. P. Robertson Prod.) with Richard Boone and Robert Cawron, William Morin, director.

MICHAEL BARR, "Quest of the Damned" (Mark III Stage Prod., Triforce Film, shooting in Yugoslavia and London) with John Brinkley and Fabio Massimo, George P. Breakston, producer-director.

EDDIE SHUTMAN, "Las Vegas" (Shooting in France).

LA BREA STUDIOS

RONALD HUGH, "Pete Malen"

W-G-N STUDIOS

JACK HILGREN, "Terrorhouse Hotel" (P-Vision & Eastman color, shooting in England) with Elizabeth Taylor and Richard Widmark, Anthony Asquith, director.

CHARLES LANG, ASC, "The Whorler Dealers" (Playways Prod., P-Vision & Metrocolor) with Lee Remick and James Garner, Arthur Miller, director.

ARTHUR HORTON, "Murder at the Gallop" (Shooting in London) with Margaret Rutherford and Flora Robson, George Pollock, director.

STE SEAR, "Tattoo Faces Three Challen'ers" (Color-P-Vision, Banner Prod.) with Jack Mahoney and Woody Strode, Robert Orr, director.

JAMES DRISCOLL, Commercial

THEODORE TUTTLE, ASC, Commercial

HAROLD SMITH, ASC, "Dr. Kildare"

DALE DEFFENSE, ASC, "The Eleventh Hour"

ROBERT HANNA, "Combat"

PARAMOUNT STUDIOS

MELTON KANISER, ASC, "Love with the Proper Stranger" (Mikala-Mallison Prod., shooting in N.Y.) with Natalie Wood and Steve McQueen, Robert Mulligan, director.

LEONARD BILANSKY, ASC, "Wives and Lovers" (Hal Wallis Prod.) with Janet Leigh and Van Johnson, John Rich, director.

LEE GARDNER, ASC, "Lady in a Cage" (American Entertainment Corp. Prod.) with Olivia de Havilland, Walter Catlett, director.

JOSEPH RUTTENBERG, ASC, "Who's Been Sleeping in my Bed?" (Jack Ross Prod.) color) with Dean Martin and Elizabeth Montgomery, Daniel Mann, director.

DAN FORD, ASC, James Fox, ASC, "You in Acceptance" (Hal Wallis Prod.) with Elinor Dooly, Ulla-Louise and Elsa Cardina, Wesley Moore, director.

KAROLLA EDGAS, ASC, WILLIAM WHITLEY, ASC, "Farewell"

PARAMOUNT SUNSET STUDIOS

FRANK PHILLIPS, ASC, "Gonimole"

PARAMOUNT STUDIOS, N.Y.

PETER GARNEY, "Short Shorts"

PACIFIC STUDIOS, N.Y.

GARYA RUSSELL, ASC, "The Nurse"

PRODUCER STUDIO

HAL MOSK, ASC, "CVI Productions" (color)

REPUBLIC STUDIOS

GEORGE DUBOANT, ASC, "The Lloyd Bridges Show"

JACK SWAIN, "Ranchero"

TWENTIETH CENTURY-FOX, N.Y.

BOB KAUFMAN, ASC, "Parche Victoria" (Hewlett Film) with Ursula Davis and Rufe Dye, Nicholas Webster, director.

JULIAN THORNTON, "The Changeling"

ARTHUR DENT, "East Side, West Side"

UNIVERSAL CITY

RUDOLPH HANLAN, ASC, "Man's Favorite Sport?" (Cleveland, Hawks-Columbia-Laird Prod., Technicolor) with Jack Palance and Paula Patton, Howard Hawks, producer-director.

GARREY POLANSKY, "Dark Passage" (Banner-Burley-Berenson Prod., Eastman color, shooting in Rome) with Shirley Jones and Kenneth Crane, Steve Barz, director.

BENJAMIN KLING, ASC, LONNIE LEWIS, ASC, "The Virginian"

JOHN BURNELL, ASC, WILLIAM MCGUIRE, ASC, "Alfred Hitchcock Presents"

ELIAS THORNTON, ASC, LEONIE LEWIS, ASC, JOHN WARRIN, ASC, "After the Thin Red"

ELLEN THOMPSON, ASC, "Wagon Train", "McHale's Navy"

RAY ROBINSON, ASC, "Laramie"

Continued on Page 244

AMERICAN SOCIETY
OF CINEMATOGRAPHERS

Founded January 9, 1919, The American Society of Cinematographers is composed of the leading directors of photography in Hollywood motion picture and TV film studios. Its membership also includes cinematographers in foreign lands. Membership is by invitation only.

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Q & A

Technical Questions and Answers

Q.—I am in the final stages of editing a comprehensive 16mm sound film for our company, for which all sound has been recorded magnetically on 16mm magnetic film. We estimate our print requirements at this time will be approximately ten prints and the labatory has suggested "electro-printing" of the sound track. As the lab is in another city, I am unable to discuss with them personally what "electro-printing" is and thereby add to my enlightenment. —R. B. McD., Santa Falls, S. D.

A.—One of the most laud explanations of electro-printing appeared in an issue of General Film Laboratories' monthly publication *Revised*. It is reproduced herewith and should answer your questions.

Electro-printing—the re-recording of a motion picture sound track direct to the sound track area of the print—provides the producer considerable flexibility of choice in sound printing.

The resulting print track is a photographic track which becomes an integral and permanent part of the print. It's the same as a "printed" track, except that it's re-recorded from the magnetic moved sound roll direct to the print—in place of the standard procedure of 1) re-recording the magnetic sound to an optical sound image track, which is then processed, and used to print the track on the release print, in a film printer operation.

Electro-printing is normally utilized for 16mm reversal prints—either color or black-and-white—in small orders. When a 16mm film goes to positive color or B&W printing it usually necessitates a large release print order, in which the use of a photographic (or optical) printing track is most economical.

More time is required for electro-printing sound, than using a printing track. On small orders this is not a major factor, but on larger release print orders it can be significant.

Then, even though the electro-printed sound quality is good there are limitations. The electro-printing process lacks the consistency of results that is char-

acteristic of the normal printed sound track. Since each exposed—then—processed print requires a separate recording run, there may be some quality variation within a group of finished prints. Also, the threading of print and magnetic track in optical recorder and magnetic playback machine is critical with the result that lip-sync match is assured, as is normal sound printing.

And, there's the economic factor we've already touched upon. General Film's rate for electro-printing is one cent a foot, additional to the normal composite print price. When this is compared to the re-recording rate for a printing track of .0009 (for film stock re-recording and processing), it becomes apparent the cost of electro-printing crosses over at eleven prints, and is an added cost for release printing from that point on—since there is no surcharge for printing sound from a printing track.

But electro-printing at one cent per foot has definite advantages:

1. For the 16mm Kinetophone film headed towards a color stereoscopic and positive release printing the First Trial color reversal print track can be electro-printed, eliminating the need for a B-wind sensitive printing track. On approval only one printing track need be recorded—the A-wind track used in positive color printing.
2. For the very small print order—a single print, or a few prints—electro-printing provides standard, high quality photographic track on the print, at low cost.
3. For the very important interlock, or presentation for approval, the low-cost electro-printed track provides professional sound as a trial print, so that changes do not involve the economic loss of a scrapped printing track.
4. Alternative track versions. Many English language releases also call for but one or two prints with the same pictures, but another language track. Electro-printing is then an obvious choice.

For normal motion picture sound printing, the use of a photographic

Continued on Page 246

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Guesting of "Wagon Train" cast, presentation of gold 25-Year Membership Cards, and demonstration of new Arriflex 16mm camera highlight February meeting of ASC.



WILL BARRELL, ASC, (left), presents 25-year Gold Membership Card to Harry Keating. Other similarly honored were Thomas Allen, Robert Brown, Howard Brindle, Willard Stone, George Crone, Jack Greenbaum, William Kern, Charles C. Loring, William Leahy, Ray Pennington, William Skall, Philip Tomanek, Charles Vandegriff, and Paul Vogel.



THE NEW ARRIFLEX 16 camera was exhibited in clubhouse lobby to ASC members and guests. Here, Albert Twining, ASC representative, explains camera's fine points to Louis Lurie (R) and Ray De Vries.



CHATTING WITH ALL Details in photo above, left, is John McWhorter. Second from left, interested (camera) are Scott Miller (far left) and Frank McWhorter, both of "Wagon Train." In center photo, Hal Mohr (2nd from L) confabulates with actor Scott Miller who later speaks briefly on his



"Wagon Train" (see John McWhorter). Second from left, interested (camera) are Scott Miller (far left) and Frank McWhorter, both of "Wagon Train." In center photo, Hal Mohr (2nd from L) confabulates with actor Scott Miller who later speaks briefly on his



camera experience. Others are Set Designer and Actor Edwin (far left) and John McWhorter. "Wagon Train" (far right) is in 2nd photo, confabulating with cinematographer Arthur Miller (center) and George Folsey as some of their mutual social rings and favorite separations.



WALTER CRONIN (back) to examine show guests Frank McWhorter, John McWhorter and Sam Wilson the ASC's collection of addition photo-pictorial material including Hollywood cinematographers. In center photo, Hal Mohr (2nd from L) confabulates with actor Scott Miller who later speaks briefly on his



"Wagon Train" (see John McWhorter). Second from left, interested (camera) are Scott Miller (far left) and Frank McWhorter, both of "Wagon Train." In center photo, Hal Mohr (2nd from L) confabulates with actor Scott Miller who later speaks briefly on his



one in background. In foreground are Sam Howard (left) and Robert Vignola. Others in 2nd photo: Ray Lurie, Cinematographer (center) and George Folsey as some of their mutual social rings and favorite separations. Election of new officers will be announced next month.

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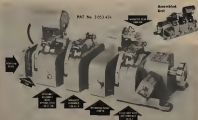
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Lab Price List

A new 16-page price list is available from General Film Laboratories, 1546 No. Angyle, Hollywood 28, Calif. All pertinent data is conveniently arranged for utmost convenience of the film producer. A step-by-step check list describing the preferred method of ordering either film processing or prints is another feature of the list—actually a 16-page brochure punched for insertion in standard 3-ring binders.

Items in the publication include precise information on prices for processing 35mm and 16mm color or B&W motion picture, TV and slide films. Typical items are developing, dailies, trial prints, dupes, internegatives, interpositives, A&H and additional roll printing, paper-to-paper printing, release prints, etc.

Rental Catalog

Sensarcon Film Service of London has recently published a comprehensive 40-page catalog of its rental services and prices. The company services film producers shooting on the British Isles or the Continent with virtually every type of motion picture photographic and production equipment. Copies of the Sensarcon catalog are available to local film producers. Write the company at 25-29 The Barroughs, Hendon Central, London, N.W. 4, England.

The Gordon Catalog

Probably the largest and most comprehensive catalog of motion picture and instrumentation equipment ever published is that of Gordon Enterprises, 5302 Chatsworth Blvd., North Hollywood, Calif. Comprising 128 pages in a sturdy ring binder, fully indexed the catalog illustrates and describes thousands of items of equipment which are available through sale or rental from the Gordon organization. One division alone lists over 7,300 lens and camera combinations. The publication was nearly a year-and-a-half in the process of compilation and production. Joseph V. Mascelli, Editor of the *American Cinematographer* Manual, assisted in the compilation.



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WIZARDRY IN SPECIAL EFFECTS

M-G-M's Special Effects Department has impressive record of accomplishment.

By DARRIN SCOT

PERHAPS THE CLOSEST thing to a sorcerer among the men behind the cameras in feature film production is the Special Effects expert. He is the craftsman who, by combining imagination with intricate technology, can create on order earthquakes, fires, floods, tornadoes, air and sea battles, plagues and the parting of the Red Sea. He is the man for whom the word "impossible" does not exist, for without his creative thought and effort the scope and spectacle of the cinema would be considerably limited.

Foremost among these cinematic wizards is A. Arnold Gillespie, who has been associated with M-G-M Studios continuously for the past forty years



A. ARNOLD GILLESPIE, M-G-M's Special Effects chief, stands beside camera barge named in his honor as he supervises camera setup for miniature shots for "Hullaballoo On The Beach."

and has headed that studio's Special Effects Department since 1936. Fitting testimony to his craftsmanship in this fascinating field are the four Academy Award "Oscars" which stand in his office. These represent top special achievements in "Thirty Seconds Over Tokyo," 1944; "Green Dolphin Street," 1947; "Plymouth Adventure," 1952 and "Ben Hur," 1960.

Gillespie points out that the categories recognized by the Academy under visual Special Effects (as differentiated from audible effects) include miniatures, full-size effects, rear-projection process, matte paintings and optical effects. Of these categories miniatures is his favorite because of the chal-



FOR SERIES OF PROCESS shots of a car careening wildly down a ten-foot road, M-G-M's special effects department constructed the setup pictured above. Car is mounted before process screen on slanted platform so wheels run free. These were made in here during takes by



electric motors in contact with tires. The second swerving of car was achieved by synchronizing operating windows and visible; the action cars fully used to picture on process screen. Camera was properly angled to exclude the extraneous mechanical details.



GILLESPIE'S ASSISTANTS are seen here constructing model of the heavily late piece for a take in M.G.M.'s tank while wires and wood machines (not shown) show up within only 42 inches deep into realistic deep sea waves.



HOW THE MINATURE came looked in the television and camera was as it was being photographed. Day looking was slightly pointed for these scenes in requirement on cameras, thereby they, thus enhancing the visual effect of the scene that was created by the other devices.

lenge they present in making them so they do not look like miniatures. He believes that if an audience can identify a miniature the effect has failed in its intent. Miniatures are not employed to save money. On the contrary, they are often extremely expensive and are resorted to simply because there is no other practical alternative. For example, it is rarely possible to sink an actual aircraft carrier, or crash a jet liner or go to Kansas and persuade a tornado to pick up a house (on cue) and whisk it off to fantasyland, as was required in "The Wizard of Oz."

When, during the period just after World War II, the script of "The Beginning or the End" called for shots of the atom bomb exploding into its famous mushroom cloud, it was discovered that no official pictures had been shot of the actual bomb drops on Hiroshima and Nagasaki. Also, at that time, all of the technical details relating to the bomb were classified as restricted.

With no photographs or data to draw upon by way of research, Gillespie and his crew set about trying to find a way to re-create the mushroom cloud in miniature. Several methods were tried but the results were visually unsatisfactory. Then he remembered a sequence from an early Tarzan movie in which the apeman wrestled a full-sized mechanically operated crocodile underwater. He recalled that when the small sacks concealed in the monster's neck were slashed by Tarzan's knife the dye used to simulate blood floated up through the water in a form resembling a mushroom cloud.

Based on this remembered clue a technique was worked out to shoot the entire atom bomb sequence underwater in miniature. The effect was so realistic

that it fooled top officers of the Manhattan Project and was used by the Air Corps in their instructional films for several years afterwards.

Similar ingenuity was brought into play during the filming of "The Good Earth," the script of which called for a cloud of locusts to swarm up over the horizon and swoop down and destroy the crops. Since it was impossible to round up a horde of real locusts and have them perform on cue, M.G.M. Special Effects department began a search for an alternative method. The solution to the problem, when finally worked out, proved to be incredibly simple and inexpensive.

An inverted camera was set up in front of a tank in which a curved piece of masonite was placed underwater. Coffee grounds were then dumped into the water from a height, gliding down over the masonite in undulating patterns. Turned right side up, the action on this film was reversed and, when superimposed on an actual scene of wheat fields, the locusts (coffee grounds) seemed to swarm up from the horizon and form in a thick black undulating cloud overhead. Closeups of the insects feeding on the plants were achieved by animating dead pickled grasshoppers with tiny sticks of wood invisible to the camera.

Tackling a very different type of problem having to do with insects, the department once was called upon to construct and mechanically animate an oversize mosquito going through a hole in a screen for closeups in a film dealing with malaria fever.

Full-scale effects involve actual people in life-size surroundings. Examples of this are the earthquakes which were created for "San Francisco" and later

Continued on Page 243



THE COMPLEX of fortress-like buildings atop Lookout Mountain is the Hollywood Hills which is the studio and headquarters of the U.S. Air Force's 1352nd Photographic Group.

HERE ASSEMBLED on the Lookout Mountain sound stage are some of the Air Force's production equipment—all of it the latest and the best the industry offers.



Lookout Mountain--Filming Center of APCS

On a hilltop overlooking Hollywood is one of the most completely equipped motion picture studios in the U.S. Its the headquarters of the Air Force's 1352 Photographic Group, nerve center of the APCS, whose film productions have won many national awards.

By HERB A. LIGHTMAN

HIGH ON A HOLLYWOOD hilltop, in an area populated by residential "cliff dwellers," nestles a complex of fortress-like buildings which house what is perhaps the world's most unusual motion picture studio. This is the Lookout Mountain Air Force Station, home of the 1352nd Photographic Group, an important nerve center of Air Photographic and Charting Service (APCS). It is equipped to produce all types of stills and motion pictures for the United States Air Force.

Commanded by Maj. Robert C. Lefingwell, with Pierre Wilson as civilian Chief of Operations, and expertly staffed by both civilian

and military film specialists, Lookout Mountain's major mission is the photographic documentation of Air Force activities and the production of scientific, technical and informational motion pictures for the Air Force, the Atomic Energy Commission and other government agencies.

Of the 165 technicians engaged in operations at Lookout Mountain approximately 85% are civilians, most of them with major studio or commercial production experience. The Camera Department under John Norwood and the Still Department headed by Sal Mainone, are equipped and staffed to photograph every type of subject

in a wide variety of formats, in both black-and-white and color.

Since the majority of personnel are civilians from the Hollywood film industry they have brought with them valuable techniques and experiences gained in that field, and their approaches to film production and the general atmosphere of the organization is much more akin to that of a major studio than of a purely military organization—even though certain formats especially applicable to the filming of military subjects have been standardized.

Much of Lookout Mountain's film production comes under the classification of "Top Secret," so

security regulations are rigidly enforced. Guards inspect everything and check everyone that goes in or out of the installation. When a classified subject is in production the sound stage is kept locked. Every inch of film or magnetic tape that is classified must be accounted for, and editors cutting such material work behind locked doors.

Shoot All Over The World

As needed, camera crews from Lookout are dispatched on temporary duty to filming locations all over the world. They cover U.S. activities on islands in the Pacific as well as at atomic test sites in Nevada. At Holloman Test Track, using a camera mount specially designed for the purpose, its film crews have photographed runs of a high-speed sled carrying a live chimpanzee to test for the accelerated "G's" with which man has moved out into space. Always the subject matter is varied and dramatic. It may be a rocket launch at a slant range of 100,000 feet over a Pacific Island testing area or the zero launch of an F-100 from its trailer bed.

Continued on Page 240



HOLLYWOOD ACTOR Glenn Ford, here posing between takes, contributed his services as mentor for the Air Force production, "Tomb Raider: The Way of Zen."

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8MM SOUND FILMS

... A Survey Of Progress To Date

IS THERE A FUTURE for you in commercial 8mm sound film production?

Ever since 8mm films became a practical reality three years ago, the medium has been struggling for recognition and attempting to overcome the obstacles which seem to hamper its progress.

Nevertheless progress has been made and 8mm sound film today is serving an ever-widening field of commercial application. The narrowest of all motion picture films, which gave such impetus to the hobby of amateur movie making, has come of age, just as 16mm ultimately did, and thanks to technical improvements both in the film emulsion and in the lenses, cameras, projectors and sound equipment allied with the film's continuing progress, strides have been made in its practical application which is reassuring to those who believed 8mm sound films had a real destiny, right from the very beginning.

On the pages that follow are four interesting reports on 8mm sound films, each of which deals with a different aspect of the medium or its use—none of it theory. If you are one of the many who has considered the commercial opportunities that the smaller, more economical 8mm sound film might open up for you, these articles should enable you to properly assess the medium's potentials in the light of recent developments.



"Report on 8mm" was subject of important discussion on closing day of the 1965 Calvin Workshop, sponsored by Calvin Productions, Inc., Kansas City, Mo.

REPORT ON 8MM*

While 8mm sound prints are being produced and used today, the demand for the medium predicted two or three years ago has failed to materialize. What has caused this dwindling of enthusiasm? Will it be revived?

IT WOULD BE NICE to report a definite statement about the position of 8mm film in the non-amateur motion picture industry. To date this is not possible. About the most that can be expected today is to identify the areas of confusion in the 8mm situation, report on what progress is being made to resolve them, and take a somewhat guarded look at the future.

We think that we have a right to speak publicly about 8mm problems. Our firm manufactured the first 8mm projector capable of projecting sound and picture from the same 8mm film. This projector was invented, developed and marketed by the late Lloyd Thompson of the Calvin Company in the early 1950's. Over 1000 of these projectors were sold. Economic factors rather than technical problems ultimately caused this projector to be withdrawn from production; however, it remained the only sound 8mm projector until others of similar design

were introduced by several manufacturers in 1960. We still use this projector today and find it quite comparable to other current models.

When this projector was introduced it was obvious that 8mm sound prints must be available for it. Much research was conducted here towards production methods for producing 8mm magnetic sound prints of the highest picture and sound quality possible. This experience largely laid dormant until the great awakening of 8mm interests three years ago. With the introduction of six or seven different 8mm magnetic sound projectors in 1960, many people predicted great potentialities for an 8mm industrial and educational revolution. We quickly activated our previous 8mm laboratory experience and have been making 8mm color prints in quantity for over two years.

One would have to be completely deaf not to have heard the tremendous predictions and possibilities made for 8mm sound film during the last few years.

Continued on Page 127

*Reprinted by permission from "The Aperture," workshop publication for 8mm film producers issued monthly by Calvin Productions.



STANDARD 8MM

HORIZONTALLY PHOTOGRAPHED 8MM
BUT IN HALF REEL/FRAME 8MM

STANDARD 8MM

DOUBLE-FRAME 8MM

This may be the answer to the search for a larger picture area for commercial eight-millimeter films.

By LOWELL RODGER

IN THE PRACTICALLY endless quest of film technicians and filmmakers alike to improve the quality of the projected image, there are those methods which tackle the problem by improving basic film characteristics, and those which obtain a sharper screen image through the use of a larger film image. It is the latter method with which this discussion is concerned. Taking the four accepted film widths presently in use in the U.S. (8mm, 16mm, 35mm, and 65-70mm) we see the greatest quality resulting, naturally, from the largest image, since it requires the least magnification to fill a given screen area.

In particular applications (such as VistaVision) it is noted that a frame of larger than normal size can be obtained on any film width if the film moves through the camera in a different manner, namely in a horizontal direction of travel. In the case of VistaVision, 35mm film is positioned horizontally to expose a frame whose height is approximately equal to the width of the normal 35mm frame, and whose width is eight perforations. Hence the area is twice normal, the degree of magnification necessary in projection is halved, and the quality on the

screen improved considerably.

While the system outlined above involves specialized equipment in practice, it is an observation of the author and others that this same technique can easily be employed in another film width where projection quality presently suffers under anything more than moderate-sized screenings.

Eight-millimeter film, long the champion of home-movie buffs for obvious reasons of economy and simplicity of handling, has come into consideration and limited use as a professional medium. Its quality at 24 f.p.s. is acceptable but usually far from that of 16mm film. For the filmmaker concerned with economy and quality, and also for the experimentalist interested in new techniques and formats, is the prospect of double-frame 8mm films.

In common practice, the conventional 8mm camera is designed to handle 16mm film, with the 16mm material bearing twice as many perforations as in standard 8mm use. The strip is run through the camera twice—on the first pass through the entire length is exposed along one half of the film's width;

Continued on Page 335



PREPARING TO SHOOT: a woman dressed for a low-budget film, using Fairchild 8mm sound camera

QUANTITY DUPES FROM 8MM ORIGINALS

G-E Credit Corporation in-plant film production dispels notion that acceptable 8mm dupes are not possible and sets example for others who would utilize 8mm sound cameras for limited low-budget film production.

By JOHN FORSES

MOST OF THE THINKING with regard to professional or commercial 8mm film production has been in terms of volume prints, with the initial photography done in 35mm or 16mm and the prints produced by optical reduction printing. It is the only way that acceptable quality can be obtained on 8mm prints, many experts aver.

As in most controversies, there are the dissenters who, with a dedicated purpose, set out to upset this claim. "It is quite possible today," they assert, "using the most modern equipment, to produce 8mm sound originals from which a limited number of good quality dupe prints may be obtained."

One of the first was Bernard Green, head of Color-Sound, Inc., of New York, who produced a successful series of sales promotion films several months ago. These were photographed in 8mm color with a Fairchild Cinephonic 8mm sound camera—the first 8mm single-system movie camera utilizing magnetic recording.

More recently the industrial use of 8mm sound films took a giant step forward when multiple prints from an 8mm sound original were successfully employed by the General Electric Credit Corporation to promote its "Accent On Value" program among its employees scattered throughout the country in over 300 branch offices.

The Corporation, a subsidiary of General Electric Company which provides consumer, commercial and industrial financing, had been searching for a means of dramatizing the company's "Value" program before its 3,000 employees. Until now, the program, which aims to stimulate customer-demand for GECC services by encouraging better service on part of employees, had been promoted primarily through newspaper, magazine and television advertising. Until now, motion pictures had not been employed in this promotional activity.

Joseph J. Heffernan, the company's Sales Promotion and Plan Development manager conceived the idea of a sound film as a means of stepping up employee interest. He suggested the production of a motion picture in sound showing individual employees explaining what the "Accent on Value" program meant and pointing out how they could

Continued on Page 230

8MM AND positive, film sound can now catch up the Perichloroethylene II enable a TV news cameraman to operate with speed and efficiency in any assignment. Sound is recorded simultaneously with picture on pre-printed film.



TV NEWS FILM — NEW ROLE FOR 8MM

U.S. television stations that have explored the potentials of 8mm film for newsreels say the results are promising and point to the inherent advantages for the news cameraman in 8mm's lighter, more compact cameras and equipment.

IN THE heyday of the theatre newsreel, most news footage was photographed with cumbersome, boxy Pathe cameras mounted on equally cumbersome tripods. Not until the advent of the Bell & Howell Eyemo was the load lightened for the news cameraman. This compact, lightweight camera with its limited 100-foot film load became the newsreel's favorite camera where mobility and quick action were required.

With the growth of television news programs, filmed material became a major factor; 16mm film replaced 35mm as the medium in this field and the single-system Auricon-16 zoomed to popularity as the TV news man's favorite camera. Portability and light weight were important factors for news cameramen working in the new era of population explosions and traffic jams.

Few newsreel veterans have considered that an 8mm single-system sound camera might someday compete with if not replace the 16's in producing qualified newsreel footage. But this, too, may soon come to pass. Experiments which were conducted

sporadically only a few years ago indicated that 8mm film images could successfully be televised and that the quality compared favorably with that of 16mm film. Today there is increasing use of 8mm film in TV newscasts.

One who has not only used 8mm news film in TV newscasts but who has become something of a proponent for the medium is Dick Hance, Executive Producer for WGN-TV News, Chicago. Hance writes a monthly column, "TV-Image" for *National Press Photographer*, journal of the National Press Photographers Association.

In his column for December 1962, Hance stated, "We at WGN-TV conducted an experiment for the 92nd Semi-Annual Convention of the Society of Motion Pictures and Television Engineers to show the feasibility of applying 8mm film to a TV news operation."

"Our news film crews were given 8mm camera equipment and were assigned to the local news stories for the day. The day's coverage was handled

Continued on Page 229

LOCATION PHOTOGRAPHY

Helpful hints for aspiring cinematographers

ONE OF THE PRIME jobs of the camera crew on location is to make the best use of the sun outside, and the available power or the supplementary power which may be used.

Direct sunlight gives the best lighting, although other factors must be taken into consideration. While the sun is one of the photographer's greatest allies, it can deal you fits if you do not plan carefully. For one thing, angles should be selected to avoid strong, objectionable shadows.

Although it is a rare occurrence, subject matter may sometimes be too contrary to Ektachrome or other color film. You are most apt to run into this situation where you have extremes of light and shadow—as in a forest, or if action is taking place within an overhang surrounded by direct sunlight. If actors are the prime subject in the frame, contrast may be reduced by clothing change. With inanimate objects, it may be possible to substitute a less contrasty subject.

Skies may "wash out" under certain conditions. This can happen when it is necessary to use considerable back lighting or reflectors, or when the sky is "flat" and slightly overcast. In this situation, it is best to wait for a good blue sky, although shooting schedules seldom permit one to do so.

Fill Light Aids

Mechanical aids can also help solve extreme lighting problems. Lens shades, of course, are a must. Reflectors, judiciously placed, will provide "fill" light in dark shadow areas. Polar screens can be used to cut down objectionable highlights, but must be used with caution. Long shots filmed in color with a polar screen cause the sky to go extremely blue and may kill interesting highlights on trees and other objects in the frame area. This can sometimes be more objectionable than contrast. Another valuable aid is the zoom lens. This can be used as your only lens with the option of zoom effects. It is easy to overuse zooms, however, as such effects are often startling to an audience and should be reserved for occasional, specific instances.

Filters plus under-exposure provide the means for making effective day-for-night scenes, which must be ex-

trremely well planned in advance. Sun shadows cannot be too prominent, and light sources must be checked. Automobile headlights, windows in buildings, streetlights, etc., must be turned on to "cheat" the desired nighttime effect. To shoot the nighttime scenes during the day, the daytime sky must go extremely dark, or be avoided altogether. Here again, the polar screen can be effective. Its natural tendency to accent blues and to reduce highlights make it valuable here.

Use Your Meter

To avoid strong shadows caused by direct sunlight, try to shoot your nighttime scenes in an overcast sky. It is now possible, as the speeds of color film continue to increase, to shoot simulated night shots later in the day.

Always use a good exposure meter and follow the recommendations of the manufacturer. For best results, spend considerable time becoming completely familiar with the meter, and check it frequently for accuracy. Regardless of the type of color film you are using, exposure color is obtained when the film is exposed at certain times of the day with light of specified color temperature. The time of day will vary; the instruction sheets supplied with your new film stock will indicate the most ideal shooting conditions for that particular stock.

If you have done any location interior shooting at all, you are aware that the power available on location for lighting is seldom sufficient for ideal work. For this reason, determine in advance all the lighting requirements

for the scenes to be shot. Then, find out all information as to the available power. The amount of power needed will be affected by the size of the area to be shot and the amount and size of the lights you feel to be necessary. Often you will find that the existing power supply is not sufficient for the job, and your only alternative is to rent or lease supplementary power generators.

In general, 60 amperes are usually available in the average home. This lighting load can be spread over two or more circuits, or the main switch can be used. Certain heavy power-draw appliances (ranges, air-conditioners, dryers, etc.), are good plug-in accessories.

Before moving a camera crew into a factory location, explain the power requirements to the plant electrician, specifying where you need power, for how long, and the sequence of the areas you will be shooting. Then, be sure to double check the voltage supplied before plugging in.

There are several lighting considerations when working with large areas. Spots generally are more effective and flexible than floods. In addition, during times of pure panic only, multiple exposures, slow camera speeds, or rephotographing transparencies may prove adequate.

Lighting The Set

To insure the best possible lighting setup, spend some time watching the normal action of the scene to be shot before moving in your lights. This usually takes only a few minutes and saves much time when you are setting up your lights. Light the set or area with the subjects in position, or with screen action camera movement before actually exposing the film.

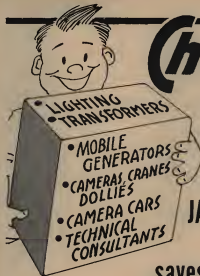
Don't be too concerned with natural light coming onto the set from windows or doors. This lends a realistic "look" to a scene and is completely acceptable to the audience. However, when you are shooting into daylight try to use as small an aperture as possible to keep the daylight from washing out completely.

When shooting location-interiors, use of a grey card and meter to determine exposure will insure dependable results because the grey card represents a better overall balance than where a meter reading is made directly of the set.

Also to be recommended is the key system of lighting on location, but for a different purpose. On a sound stage set the key system is used to calculate exposure. On location the key system is used to position lights only. This enables us to establish a basic lighting procedure, both on the set and on location, in giving directions to grips and

Continued on Page 246





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QUANTITY 8MM DUPES

Continued from Page 228

recent values in their own particular jobs. An unpretentious film having a simple approach, he believed, would have greater impact. A highly polished film might detract from the obvious sincerity of GECC employees who were to act in the film, he said.

To carry out this objective John C. Johansen, a member of Heffernan's staff, was chosen producer of the film and authorized to acquire the necessary camera and equipment to accomplish the job. Johansen was familiar with the Fairchild Corporation 8mm sound camera and from results he had seen obtained with this camera, was convinced it could produce a film having both the sound and picture quality that would not be limited number of good dupe prints.

Using nothing more than the Fairchild camera, a meter, a multiple light bar plus a single fill-light, Heffernan carried out his assignment, visiting various GECC branch offices where he photographed and recorded the comments of employees at random while on their jobs. In all employees in a wide range of job categories were photographed ranging from company President C. G. Kleck to a secretary at her desk. Also credit specialists making calls, an area sales manager visiting an appliance dealer's showroom, an industrial credit sales manager of the company calling on a manufacturer, and a service center manager working with a G-E computer were typical subjects of Heffernan's 8mm sound camera.

When all shooting was completed the film was sent to Cine Magnetix Inc., of New York, for processing of the original. Afterward, Johansen edited it down to approximately 25 minutes screen time. The original sound track was transferred to 16mm magnetic film for re-recording on the dupe prints.

Heffernan estimated the company would need 23 prints of the 8mm color sound film. A sample print was run off and screened for the approval of G-E Credit Corporation's executives. The order for the additional 22 prints is believed to be the first of its kind and that it marks the first time that multiple prints of acceptable commercial quality have been produced directly from an 8mm sound and color original.

Prior to undertaking this do-it-yourself sound film production, the company had obtained estimates from industrial film producers for a 25-minute 16mm sound film on the subject. Average estimate was around \$25,000, whereas the total cost of the 8mm sound film produced by the company itself was \$500. This included rental of the Fairchild camera and related equipment, film, answer print and re-recording of sound, but did not include the 23 dupe prints.

Commenting on the accomplishment, Heffernan said, "The film gave us an extremely effective and dramatic communications tool with which to reach our employees on a nationwide basis with a minimum of expenditure. Although prints of the film were normally screened to groups of 15 to 20 employees at a time, as many as 60 attended some showings."

Some indication of the film's success is the fact that International General Electric requested a print for showing in Europe and another print has been sent to Mexico at the request of the G-E affiliate in that country. While a 25 print order is not considered large in the industrial film business or by film laboratories, still it is significant. In these embryonic days of 8mm sound film it is encouraging.

8MM TV NEWS FILM

Continued from Page 227

exactly as if it were 16mm film. Earlier controlled tests on a closed-circuit TV system had indicated that the definition of films reversal film was comparable to 16mm.

"That evening we produced one of our regularly scheduled 10 p.m. news casts using 8mm sound and silent film. During the broadcast, the quality did not come up to our full expectations because of a grain problem. Our original plans called for the use of Dupont 930 and 931 raw stock, perforated for 8mm and prestripped. At the last minute, it was discovered that the stripping on the Dupont 931 stock did not meet standards, so we had to switch to Eastman Tri-X. Processing procedures had already been set up and could not be changed, and we obtained a greater grain structure on the fast speed film. Aside from this, the handling of 8mm proved no more difficult than 16mm. The only added equip-

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The projector is a converted front shutter Simplex with a two jet intermittent 16mm or 35/32 film runs at a speed of 144 ft per minute while 35mm film runs at a speed of 165 ft per minute.

1. A variac controls the light intensity.
2. A 500 watt lamp is used for 16mm and a 1,000 watt for 35mm (a blower is used to cool the lamphouse).
3. A 2 1/2 inch projection lens is furnished with each unit.
4. A start-stop lever controls the power to the lamp and motor.
5. The magazine and take up core takes up to 3,000 ft of film.
6. Upper guide rollers are made to handle the film from either direction of the feed reel.
7. A free wheeling take off flange is provided in the magazine.
8. A lamp near the takeup reel permits hand inspection of the film prior to takeup.

NOUVEAU

Le projecteur contient un obturateur Simplex à roue transformé avec deux vitesses intermittentes. Les films de 16mm ou 35/32 tournent avec une vitesse de 144 pieds à la minute, tandis que les films de 35mm tournent avec une vitesse de 165 pieds à la minute.

1. Le régulateur de voltage d'intensité d'éclairage.
2. La lampe de 500 watt est nécessaire pour les films de 16mm, et de 1000 watt, pour les films de 35mm (un ventilateur est mis pour rafraîchir le chambre de la lampe).
3. L'objectif de 2 1/2 est installé.
4. La manette de mise en marche et d'arrêt contrôle en même temps la lampe et le moteur.
5. La bobine de films avec noyau peut contenir 3000 pieds de films.
6. La roue supérieure est construite de manière de recevoir le film dans les deux directions, comme par la bobine centrale.
7. Une roue est installée pour libérer rapidement le film de la bobine.
8. La lampe se trouve près de la bobine récupératrice, et donne toute facilité pour inspecter le film à main dans le projecteur.



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NUOVO

Questo proiettore è un Simplex trasformato, obturatore al fronte, meccanismo di scatto di due punti. La velocità di proiezione in 16 o 35/32mm è di 144 piedi per minuto, e in 35mm, di 165 piedi per minuto.

1. Controllo manuale della luminosità della lampada.
2. Lampada di 500 watt per 16mm e di 1000 watt per 35mm.
3. Obiettivo di proiezione di 2 1/2".
4. Maniglia per controllo di motore e lampade di proiezione.
5. La cassetta porta pellicola può contenere 3000 piedi.
6. I rulli superiori di guida sono costruiti per operare con film proveniente da entrambi delle bobine avvolgitrici.
7. Disco con montatura sporgente nel magazzino.
8. Una lampadina illumina le bobine avvolgitrici, permettendo l'ispezione manuale del film prima che si avvolga nel proiettore.

NUEVO

Este máquina es un proyector simplex convertido, obturador al frente y movimiento intermitente a doble guía. Para 16mm o 35/32mm, la velocidad fija de proyección es de 144 pies por minuto, para 35mm es de 165 pies por minuto.

1. Un reostato controla la intensidad de la lámpara de proyección.
2. Para 16mm se usa una lámpara de 500 watt, y una de 1000 watt para 35mm (un chorro de aire ventila las lámparas en ambas bobinas).
3. Cada unidad está provista de un lente de proyección de 2 pulgadas y media.
4. Una palanca de control opera al motor y la lámpara simultáneamente.
5. Capacidad de proyección: rollos de hasta 3000.
6. Los rodillos de guía superiores operan con la película en ambas direcciones.
7. La tapa de la bobina de carga es desmontable.
8. Una lámpara ubicada junto a la bobina de bobina permite la inspección manual de la película antes que se rebobina en la bobina superior del proyector.



One - Two - Three

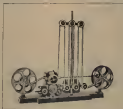
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ment was a set of 8mm rewinds and preview projector.

To broadcast the 8mm film, we used a modified Fairchild Casaphone projector, projecting the image directly into a vidicon film chain system. A five-blade shutter replaced the standard shutter to eliminate "shutter bar." Also a synchronous motor replaced the standard projector motor to give constant controlled speed.

The standard Fairchild 8mm magnetic sound camera was used with no modifications. The silent news film camera used were standard Bolex 8mm camera, using regular 100-foot daylight loading spools of double-8 film.

"I have reached these conclusions from this experiment:

"(1) 8mm can be readily adapted to TV news film work, when professional equipment becomes available. Existing equipment is manufactured for a consumer's market and is not dependable enough for the heavy stresses of professional use.

"(2) Tests indicated that when the present black and white reversal film are used, the definition of the picture is acceptable for TV news format.

"(3) More caution has to be exercised in the handling of the film to prevent scratches and the accumulation of dirt.

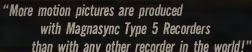
"(4) The sound quality from the magnetic strip is as good as the single-system optical tracks of 16mm film.

"(5) Tests indicated that 8mm color film shows excellent definition through the color chain system."

In his February, 1963, column Dick Henne summarized the activity to date as use of 8mm film in TV news:

"KPHO-TV, in Phoenix, Arizona, has been experimenting with the Fairchild sound camera and projector. They ran into a film grain problem because they were processing double 8mm film as negative. They are now using reversal film, which has eliminated the grain problem. It appears that, generally speaking, there is less grain when using the reversal system.

"Ray Carrio, KPHO's News Director, writes that they just received three new Fairchild Zoom Cameras, and the sound quality has greatly improved. They have also concluded that the Agfa Sontar 8 gives them "fantastic sound quality." KPHO engineers are currently converting the German projector from a three to a five-blade shutter, so that it will work into the film chain system.



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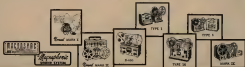
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"CHAN-TV in Vancouver, B.C., is using a standard Fujica Beam sound projector with the addition of a 35° inch projection lens. They changed the running speeds of both camera and projector to 30 fps, thereby keeping the standard three-blade shutter. They use Fairchild sound cameras with lenses and have had some problems with the sound quality through their TV system.

"Charles Carter, Chief Engineer, WESH-TV, Orlando, Florida, intends to equip both their Orlando and Daytona Beach studios with Fairchild cameras and converted projectors. From experiments with 8/8 (double-8mm film), they are convinced that it will become an important working tool in their TV news operation. Carter feels that in the near future he will be able to reproduce beam pictures as good as 16mm.

"Carroll McGaughey, News Director of WSOE-TV, Charlotte, N.C., is very enthusiastic and is forging ahead with the 8/8 format. He has written a de-

tailed report on WSOE's experiments with 8mm and will be glad to forward it to interested parties. Contact him through P.O. Box 2546, Charlotte N.C.

"WSOE's engineering department stripped a Fujica Beam projector of everything except its basic film transport and sound head. Then McGaughey designed a special cast aluminum base with a custom-fitted metal housing for permanent installation. This unit has undergone extensive tests for video quality. The results have been excellent. The station also changed the shutter from 3 to 5 blades. A sync-motor was installed and a switch was inserted into the system so that they could change from 24 fps to 18 fps and use amateur film shot in amateur cameras.

"McGaughey reports 'beam for news work is undeniably just around the corner for forward looking news operations. Its use will be limited for some time, but within its limits, it will prove an available and relatively inexpensive tool'.

"To the best of my knowledge,

NEWSREEL TRUCKING SHOT



Former President Harry S. Truman, noted for his penchant for early-morning walks, found local seashawks right on the job when he visited San Diego recently. KGO's enterprising TV news cameraman George Putter unfurled a toy wagon pulled by an assistant to get smooth trucking shots of Truman on one of his sunrise walkabouts, shooting with a Transit 0-Sound Amplifier-equipped Autronic camera mounted on a Body Brace Camera Pod. All three—amplifier, camera and pod—are distributed by S.O.S. Photo-Cine Optics, Inc., of New York and Hollywood.

KAKE-TV, Wichita, was the first to see the potential of Bmm, back in 1957, when they modified an 8mm Kodak projector so it was synchronized with the sweep of the video system. According to Paul Threlkeld, KAKE's Director of Photography, this same unit is still used when only amateur Bmm film is available for a TV news story, and it proves a "godsend."

As a result of Bance's monthly reports on the progress of Bmm film and equipment in the recording and telecasting of news, there has been enthusiastic response from broadcast stations throughout the world.

Bance looks forward to significant steps being taken soon to establish standards for professional application of Bmm film.

"Television's demands," he says, "will force manufacturers to create professional Bmm equipment for our industry. Also, color will play an increasingly greater role in TV news film work."

WE ARE indebted to the National Press Photographers Association for permission to quote from Dick Bance's monthly column. —EDITOR.

DOUBLE-FRAME BMM

Continued from Page 225

the takeup spool is then inverted and replaced on the camera's upper spindle, becoming the feeding spool, and the other half is exposed on a second run through. When the film is processed, two complete records are seen side by side. They are running in opposite directions, so that any one frame is inverted as compared to the frame beside it. This double strip is slit and joined end-to-end to form a single Bmm strip. (See diagram.)

The fact that every dimensional aspect of the Bmm format is exactly half that of 16 (including perforation pitch, frame width and height) and also that the perforation size is identical, as is the unexposed margin in which the perforations occur, leads to certain compatibilities between the two.

The film with which an 8mm camera is loaded runs as well as a 16mm camera, with the sprockets skipping every other perforation. The film advance in a 16mm transport is twice that of an 8, and were the exposed roll handled in the standard Bmm way, every 16mm frame would be cut in half vertically.

When the film is put up in a single Bmm strip, the result is a roll of frames twice the size of normal Bmm frames.

In practice the necessity of horizontal travel comes into play to produce a format of near-normal proportion. A 16mm camera is mounted on its side, with the right-hand side of the camera down to provide right-to-left movement. What would be the left-hand half of the aperture is masked with a standard vertical split-frame matte. The viewfinder is similarly masked. Note that all mention of verticals is in reference to the normal position of the camera, so once the new mounting is in effect all factors become horizontal.

The effective coverage of such lens as cut in half, introducing a new consideration. When a 16mm wide angle lens is used, for example, its exaggerated perspective will be present but its expansive coverage will not. A 16mm telephoto becomes the equivalent of a higher-powered lens, since just half its already narrow field will now fill an entire frame and eventually an entire screen. The normal 25mm lens becomes a moderate telephoto, and consequently a wide-angle lens of at least the scope of an 8mm must serve as the normal coverage lens of this system. There is no other compensation necessary in photography.

The full length is run through and then inverted and rethreaded as mentioned to expose the previously masked portion of each 16mm frame.

In editing, a 16mm viewer is used equipped with studs in the film path to keep the Bmm film running along the rear side of the path. The film appears on the viewer screen occupying only half the normal field, standing on end. To correct this, the viewer is rigged with its film path perpendicular rather than parallel to the direction of film travel from left- to right-hand rewind. A simple series of Bmm rollers may be devised to guide the film through its two 90° turns—one before, one after going through the viewer.

Splicing is done on a standard Bmm or 16mm splicer offering the least splice visibility. This is important as frame overlap will now appear at the sides of spliced frames, rather than at top and/or bottom; and vertical disturbances in the projected picture tend to be more noticeable and annoying than horizontal ones.

Printing from a double-frame Bmm original would have to be done in a 16mm printer, having half its gate



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masked and the film path slightly altered to keep the film strips in line for contact printing. Projection is done on 16mm equipment, the projector lying on its right side and the gate and film path masked and augmented as in the printer. A projector that is operated horizontally must be provided with a lamp designed for horizontal use, since standard projection bulbs have the filament mounted vertically for base down burning. Were a bulb of this type turned horizontally the filament would sag and eventually short, cutting lamp life considerably.

Some Other Methods Proposed

Eduardo Carranza has been working on double-frame film for some time, considering it a moderate wide-screen technique. If the approximately 1:1.5 image can be considered wide, it is indeed modestly so. But Mr. Carranza has achieved double-frame film through alteration of standard film equipment, and not 16, which requires some technical facility and possibly some cost. This format is a new use for 16mm film, as the author sees it, not on film equipment but rather on 16, for it is only with a 16mm camera, printer and projector that the technique is possible without alteration of basic mechanism. The picture quality is certainly better than that of standard film, and likely not quite as good to standard 16mm, though it saves film as compared to normal 16mm consumption.

Robert L. Neyman and Floyd E. White, of the Apollo Corporation in Los Angeles, are advancing a system of double-frame film photography in which the basic camera footage is not shot but remains intact as a 16mm roll, bearing two series of images running in opposite directions. This roll of film is similar to a dual-track tape recording wherein the takeup reel is inverted after one run through and then he comes the provider. Projection of A/16 format film, as Neyman and White call it, is accomplished in basically the same way, using 16mm equipment and a masked aperture. One problem they have not solved is that of editing; due to the fact that two film records are sharing the same piece of film, a cut into one is necessarily a cut into the other.

Another new format on 16mm film, bearing 8mm perforations, is the French Panoscope system. A camera called the *Émil Panoscope* exposes a frame of standard film height across

the film from sprocket hole to sprocket hole, producing a non-anamorphic wide screen format of over 1:2.5. This film is projected as 16mm film on a comparison Panoscope projector equipped with 8mm type advance and extra-wide aperture.

The need to work on film perforated for 8mm advance depends on the equipment through which the film will run and also on the manner in which the lab is expected to handle the film. The first system described here does not utilize every other sprocket hole on a roll perforated for 8mm. Due to the timing of its equipment, film laboratories generally are not able to fit film bearing standard 16mm perforation spacing. In the A/16 system, the standard 16mm film used does not require any special handling whatsoever and so all standard 16mm materials are usable. For a system such as Panoscope, which uses 8mm-type film (and is not still) the film requires some special attention in the lab. Several 8mm film types are available in 100-foot leads to accommodate Bolex M-8 cameras, and would be suitable for all applications.

REPORT ON 8MM

Continued from Page 224

These revolutionary uses were limited only by the imagination. The apparent size and price economies of 8mm sound film captured the enthusiasm of most of the industry. Progressive, thinking people did project these possibilities into future untapped uses of film and the opportunities seemed to be tremendous.

I think most of us now agree that 8mm has not achieved these possibilities. I think we must also agree that it may not do so in its present form. While 8mm sound prints are being used now, there is no great rush to it in any fraction of the prodigious made one or two years ago. What has caused this dwindling of enthusiasm, and will it be reversed?

That depends; 8mm prints with magnetic sound works as they are made today are expensive. If we expect the tremendous 8mm print usage, we must have price considerations of less than the 50-70% price of 16mm prints. However, as long as printing laboratories are required to print, stage, and record 8mm magnetic prints in separate operations, economies of



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REPORT ON 8MM

high production in 8mm simply cannot match those of 16mm where a sound print is made in one high-speed laboratory operation. There have been rumors that film would be manufactured with the magnetic stripe already applied. This would help.

It is difficult to accurately evaluate customer reluctance to 8mm picture quality. We know our 8mm photographic quality is quite good and compares favorably with any in the industry, however, we often get the comment, "Well, it's all right—for 8mm."

Things are being done to meet and

resolve such problems as which sound to use—optical or photographic. Mr. John Meurer, of JM Developments, Inc., gave a demonstration of optical sound at the 1962 Workshop. He recently gave a much better demonstration at the Clarage SMPTE Convention. At the same convention session, another demonstration of optical sound was given by Mr. John Karlin of Chicago. Both were impressive, although probably somewhat short of 8mm magnetic sound quality; it is generally admitted that magnetic 8mm sound quality can be excellent. The point is that optical 8mm sound was shown to be a reality rather than a laboratory curiosity.

The point for optical sound being the key to open the 8mm gates is that of print economy. With optical sound we regain the one-pass high-speed printing potentials of 16mm. With this economy, price breakthroughs in 8mm are possible.

Last May at the Los Angeles SMPTE Convention, a representative of the Eastman Kodak Company heated at that company's position in regard to 8mm prints. Kodak admitted that much research was being done to change the format of 8mm film. By format, we mean picture size. The preferred size on 8mm film is the same as on 16mm. Is this needed? Can smaller perforations be used? This could lead to bigger picture area and better screen quality.

Kodak's statements had one electrifying effect. Much development work has stopped—or has gone undercover. No one wants to design any new laboratory equipment for 8mm printing if any dimensional changes are contemplated for the film. Probably this same thinking spread to 8mm industrial users. Should they buy existing 8mm magnetic projectors when something new and probably better is on the way? This describes pretty well the present state of confusion.

One interesting complication results from the necessity of our motion picture engineers. All of the optical 8mm sound proposals in this country have considered placing the sound in an unused area near the film perforations and the edge of the film. A Japanese 8mm optical sound projector has been on the market that takes film with the sound on the left side, similar in configuration to 16mm. Another interesting example is the Apollo A 16. With this projector, the film is projected horizontally instead of vertically. One half of the picture is placed on the top half of 16mm and the second half on the bottom. Larger picture size and optical sound are possible. The print is merely projected sideways to the halfway mark where it automatically reverses. This also provides continuous projection without rewinding. Other interesting and novel considerations are being investigated to the point where we really should call this field Small Format Sound Film, rather than 8mm.

It is apparent that some standardization must be made in Small Format Film if progress is to be made. When standardization is considered, people look to our technical societies for an-

surance, The Society of Motion Picture and Television Engineers was in the focus for the small format problem. While desiring to help, the SMPTE was in a somewhat difficult position: its function is to offer the mechanism for industry standardization. With the small format situation we really do not yet have a product to standardize. It is not the function of the SMPTE to dictate to the industry whether we should have magnetic sound, optical sound films, or other format. This must be decided first by industry, and then comes standardization.

The Society did feel that it could exercise more leadership, however. A special technical committee was created recently to survey this entire situation. The charge to the committee from the SMPTE engineering vice president, Dr. Deane White, reads as follows:

It will be the responsibility of this committee to develop, for fields such as educational usage of small format films, information on the technical characteristics—utility relationship by:

1. Assembling and developing relevant technical facts concerning the performance of today's 8mm motion picture system.

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2 Considering proposed variants from today's system and knowing their technical importance as solutions to problems evident from data collected under the above.

3 Reporting the results of their work to the Society, including such recommendations to Engineering Committees as they reach."

Dr. Louis Forsdale of Columbia University, chairman of this committee, has asked for assistance in evaluating the present Remo system in the field of business and industry. A questionnaire has been prepared for this purpose. You can assist this committee by completing the questionnaire, copies of which may be obtained by writing to Bill Hedrick, Cabela Productions, Inc., 1105 Truman Road, Kansas City 6, Mo.

LOOKOUT MOUNTAIN

Continued from Page 221

Lookout Mountain's qualified aerial cameramen (both civilian and military), for whom the term "daredevil" is something of an understatement, fly a variety of air-to-air assignments including such missions as recording the drop of an X-15 from its Mother plane, the flight of a U-2, the crack aerial-aerobol Thunderbirds in action, as well as the performance of a wide range of supersonic aircraft in flight.

Camera crews in the field are constantly encountering challenges which call for special photographic methods and equipment. In filming Operation Filibuster, a great tactical weapons maneuver recently conducted in western Florida, remote controlled cameras were set up to record air-to-ground strikes on targets located in impenetrable areas of swampland. Photographic equipment was flown in by helicopter, but the extremely difficult terrain precluded the strapping of conventional hand-lens to shoot and stop the cameras. An "S.O.S." in Lookout Mountain resulted in a highly sophisticated piece of equipment being rushed to the location to solve the problem.

It consisted of a small, highly portable, battery-operated radio-transmitting console with four buttons, each of which, when pressed manually, generated a separate and distinct tone signal that was picked up by a tiny receiver mounted on one of the remote cameras. Thus activated, the receiver

closed the relay between the camera switch and the battery power supply, starting the camera mechanism. Thus, all four cameras could be turned on separately at different times, each responding to the frequency of its individual tone signal—or, by means of a simple play-in adjustment, all could be rigged to respond to the same tone signal and start simultaneously.

During the Filibuster operation the remote control console was operated from a helicopter hovering some distance away where it could spot planes approaching the target area and start the cameras at exactly the right moment.

Many of the films made at Lookout Mountain feature actual air Force officers or technical experts playing themselves in front of the cameras. However, because of its location in the film capital, the film unit is also able to draw from the ranks of Hollywood's screen talent to lend an extra touch of professional finish to their productions. Many of the top stars of the industry have volunteered their services for films of national or international significance. Jimmy Stewart starred in "The Air Force Mission." Glenn Ford appeared in "Taiwan, Isle of Freedom." Bob Cummings and his son were featured in a film on Air Force Academy activities. Other films produced at Lookout starred Tennessee Ernie Ford, the late Dick Powell, famed aviator Walter Cronkite, and James Arness—Mammoth Dillan of TV's "Gun Smoke" series. Lookout Mountain camera crews also document the annual Bob Hope Christmas tour, accompanying the famous comedian and his troupe as they bring holiday cheer to American servicemen stationed throughout the world.

Motion pictures produced at Lookout Mountain have received numerous awards from domestic organizations (such as the Industry Film Producers Association) and from organizations in foreign countries. Last year, filming of a spectacular display of precision flying by the United States Air Force Thunderbirds and the pilots of several far Eastern nations produced an Academy Award nominee called "Breaking the Language Barrier."

A series of "People-to-People" films designed to promote understanding and good will between Americans and the peoples of far-flung nations have been produced by crews on location assignment from Lookout. One of these was filmed on Taiwan, another in Korea. Working outdoors as well as in

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units and includes 15 Mitchell (plus several Arriflexes and a wide range of special purpose, high-speed units. The sound stage is equipped with a variety of standard studio lighting equipment. Masterlite and Colconair portable lighting kits are used for much of the filming of location interiors.

An experienced animation staff, working with top grade equipment that includes the latest model Oxberry animation stand, turns out technical animation sequences to effectively portray abstract or extremely complex ideas, the workings of intricate mechanisms, or a cross section of an atomic weapon.

The Lookout Mountain Sound Department is headed by William A. Masler, former Sound Director of Warner Brothers studio, and a veteran of 30 years service at that studio. The Sound Department, which was totally destroyed in a fire a few years ago, now boasts the latest and best recording equipment available. Its installation designed and supervised by RCA engineers, is virtually new and includes a twelve channel recording console with every possible quality control.

Original sound recordings processed here are received from Air Force production units situated throughout the world. Whether on quarter inch tape, 16mm, 8mm or 35mm magnetic film, or optical tracks on 16mm or 35mm film, regardless of the medium the department is capable of reproducing and includes 15 Mitchell (plus several Arriflexes and a wide range of special purpose, high-speed units.

ing and re-recording all of them.

An important adjunct of the sound department is its wide and varied sound effects library to which new additions are made regularly. It goes without saying that since a typical audience of Air Force personnel includes many experts in many fields, the sound effects dubbed into Lookout Mountain film productions must be completely authentic.

Because the sound tracks and the entire content of each film production is subject to the critical appraisal of AFCS headquarters, critical screenings are presented with the sound on a separate film interlocked with the picture. All final dubbed masters are set up as triple track on a single magnetic film. The dialogue, music and effects, if any, are recorded on this film side by side in separate tracks in dubbed balance for interlock screening, using a triple head playback pickup. Thus, any changes recommended as a result of the critical screening of the picture can be easily made simply by changing the relative balance of the tracks or by inserting new sections of recorded sound. In this way, costly, time-consuming re-dubbing of productions is avoided.

While a lot of the film unit's personnel production knows how rubbed off on them from close association with technicians at nearby Hollywood, much of what is now established as regular



"Zanuck saw his home movie — thinks the guy's got possibilities."

(Reprinted by request)

procedure there is the result of the unit's own explorations, improvisations, and application. One has only to view some of their recent films to realize how tremendously important motion picture films are to the welfare, the progress and the efficiency of the U.S. Air Force.

SPECIAL EFFECTS

Continued From Page 279

for "Green Dolphin Street." In a climactic interior sequence for "San Francisco" involving four hundred players, balconies loaded with people came crashing down, walls fell in and the entire set shook back and forth, tilting as much as three feet laterally in a scientifically accurate pattern of destructive horizontal motion. Due to extremely careful rigging none of the players in the scene was injured.

A number of interesting methods have been developed at M-G-M to achieve spectacular aerial effects. For "Test Pilot" M-G-M developed devices that made possible full-scale airplanes to loop-the-loop and roll in front of a process screen. Later, in "A Guy Named Joe," a P-51 was maneuvered hydraulically so that it could roll and dive in a realistic fashion in front of a process screen.

Recently, for "Two Weeks in Another Town," an ingenious device was used to violently whip a full size automobile about in front of a process screen to simulate a wild ride down a winding road at high speed.

To film many of its effects involving water, both full-size and miniature, M-G-M uses a 300-foot square tank located outdoors on Lot Three adjacent to the studio. Across the rear of the tank is a backing 328 feet long by 60 feet high. By painting this backdrop to represent various types of skies, effects can be accurately controlled. Night scenes (as he shot in broad daylight with an effective portrayal of fire, a city illuminated or a lighted ship, M-G-M was the first studio to slope the backing at an angle in order to pick up more light. The backing is often used alone, with no water in the tank, for effects sequences such as the oil field gusher and fire featured in "Cimarron."

The tank was used extensively for sea and shipboard sequences for "Plymouth Adventure," "The Wreck of the



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Mary Deane, "Ben Hur," and "Monty on the Bousty." Depth of the water in the tank is 42 inches, except for three pits in the tank that accommodate action where deeper water is needed. One of these is 16x10 feet in size and 30 feet deep. The other two are 20 feet square and 12 feet deep. Normally these pits are covered over with hatch covers and are opened only when it becomes necessary to sink a ship or show a submarine diving. In "Atlantis, The Lost Continent" the pits were used to conceal hydraulic rams and other devices for lowering the legendary city beneath the waves.

The first version of "Ben Hur," produced in 1925, was filmed entirely in Italy. The famous sea battle was staged with full-sized ships. Gillette, who was then an Art Director, was aboard a galley rigged to burn and sink with 400 lifelines on deck. To duplicate this naval battle on a larger and more spectacular scale for the second version, a number of different effects were combined. One problem was immediately evident: a sea battle with modern ships has the advantage of explosives and noise to give it dramatic impact, but because ancient galleys involved no

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explosions or those in operation, other methods had to be found to achieve spectacular lighting. This was done by having fireballs through the air and maneuvering the ships so they would crash and side sweep each other, breaking off oars, etc. Some of these scenes were shot in miniature and intercut with scenes involving full-size sections of the galleys. Many miniature shots were also used in traveling matte process to combine as backgrounds with full-sized action foreground shots.

The latest version of "Matins on the Beauty" prevented many problems, particularly in the creation of the storm and fire sequences. These scenes were shot in the tank using two mini-

ture ships—one 1/6 scale (2 inches to the foot), the other, 1/3 scale (3 inches to the foot). The latter model was large enough to accommodate the camera on deck, permitting many spectacular shots to be made. Many of the "Beauty" miniature scenes of the storm and the fire were also used as process backgrounds for composite scenes that included real people in the foreground.

The rear-projection process, which has been in use in studios for many years, has always involved a basic disadvantage in that the background scene being re-photographed, is in effect a duplicate while the foreground action is original negative. The duplicate quality of the background scene was mini-

SPECIAL EFFECTS SHOT



Using A Technique of triple back-projection to simulate a complicated radar display, production staff of Stewart Films, British industrial film makers, is shown at work on special effects sequences for "Radar Reporter," an Admiralty Training Film.

A pre-filmed radar picture is projected from the specially-designed background process projector (left), via three mirrors on to the radar display table in background. Two film strip projectors project colored gaudes via a third mirror. The combined picture is filmed from overhead by the vertically-mounted camera, while ambient light is used to illuminate the hands and arms of the plotters.

On scaffolding with telephone is John R. F. Stewart, head of company, directing the radar photography. (Photo courtesy of the British Admiralty.)

ably constructed by shooting original negative right on top of it. The discrepancy was not so glaring in black-and-white photography, but with the advent of color photography it became much more obvious. Numerous tests were conducted by M-G-M and other major studios and by Technicolor to establish what compensations had to be made in the background prints so they would have more of the qualities of original photography.

A most important discovery was that more light was needed to expose the background image than could be provided by a single projector. So triple-head projectors were designed that superimposed on the process screen three identical images precisely, one on top of the other. The former background portion process involved two projectors projecting at right angles into mirrors, and a third machine projecting directly toward the process screen. M-G-M subsequently developed its own method that has all three machines projecting straight ahead. Key-stoning is avoided by means of a rack-over system of lenses positioned so that one picture can be directly superimposed over another.

Recently M-G-M engineers have developed a revolutionary advancement in rear-projection photography incorporating its "Laced Process" method, details of which will be reported in a future issue of *American Cinematographer*.

Matte Paintings comprise another major category of visual Special Effects at M-G-M that is continuously very important in film production. The technique makes possible the filming of scenes of great apparent scope and production value by building only part of the set, the remainder being painted to match and printed in optically later.

This method is effective, for example, when shooting on a main street where the aim is to make actual two story buildings appear to be several stories taller. The camera must be set up far enough back to allow room at the top of the scene frame for the extra stories that are added later by means of a matte painting. While it is usually the upper portion of such compositions that is painted in, it could conceivably be the lower area, such as in a scene where figures near the top of the frame are seen moving along the edge of a precipice that actually does not exist.

In making a matte painting shot, a frame of the scene to be matched is

projected onto a white card. The lines of the composition to be extended into the painted area are sketched and meticulously checked by viewing directly through the camera lens. The painting has to match the original scene precisely in perspective, color tone, density and the direction of the light source.

At M-G-M the method has been improved so that matte paintings can be passed optically, producing the effect of actual camera movement within the scene, even though the camera was stationary when the shot was made. Original photography is done on 65mm film with the lens of the optical printer moved well within the frame so that there is room to pan or tilt. This added movement lends an illusion of realism to matte painted scenes, which was not possible to achieve in the past.

Sometimes a third component, such as moving clouds or birds flying, is added to give a painted sky more reality. This was done in the extremely complicated opening harbor scene of "Mutiny on the Bounty" in which the camera moves from a combination of miniature and matte painted water and ships to a full-size set on the bucket, as a long pan and tilt down. The birds, optically superimposed from a separate negative by means of the Rotoscope process, added an extra element of visual continuity to the scene.

During his long tenure at M-G-M, A. Arnold Gillespie has worked with many of the top special effects cameramen in the industry, including ASC members Max Fabian, Harold Macarath, Clarence Sifer, Harold Lipsman, Mark Davis, and Harold Wallman, and Jack Smith and Walter Landis.

"This sort of work is never a one-man job," Gillespie said. "It involves many specialists in the prop shop and metal shop, as well as powder men and water men—all loyal, wonderful, capable craftsmen. Without their skill and very able assistance much of our work would never be possible."

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LOCATION FILMING

Continued from Page 328

patrons in the placement of lights.

Exposure remains the most important item so far as photography is concerned. Sometimes exposure has to be determined as much by experience as by meter. And, if you're ever in doubt, make two takes using different exposures. Shoot the second take slightly on the dark side if there is a question, as most labs can make more satisfactory correction with under-exposed film than with film that is over-exposed.

Continued and reprinted from Vol. XX, No. 3 edition of *The Operator*, workshop publication for 35mm film makers issued by Colin Trachtenberg, Inc., Kansas City, Mo.

BEHIND THE CAMERAS

Continued from Page 326

JOHN MACKENzie, ASC, "Leave It to Beaver".

WALTER STRICKLE, ASC, "Wide Company".
CLIFFORD STINE, ASC, "The Edge of the World" (Rendall Goodley Prod. - Eastman Color) with Tony Randall and Paul Hens. Harry Keller, director.

ROBERTA METTY, ASC, "Capitola Newsman, M.D." with Gregory Peck and Tony Curtis. David Miller, director.

FRED MARSH, ASC, "Going My Way".

WARNER 1965.

HAROLD LAYTON, ASC, "Tale of Two Cities" (Technicolor) with Tony Danza and Gennie Stevens. Norman Taurog, director.

RAY FERNSTROM, ASC, "Hawaii Eye".

HAROLD STINE, ASC, "Bent Greenway", "The Endless".

BURT GLASSMAN, "Temple Hostess" (Unit).

HARRY STRANDLING, "Marty, Marty" (Merrill LeMay Prod., Technicolor) with Debbie Reynolds and Betsy Nelson. Murray LeRoy, director.

CARL GOTHELM, ASC, "Time".

ROBERT HOFFMAN, "77 Sunset Strip".

20th-CENTURY ARTISTS

MYRON ARON, CINY FEITZ, "Ragged".

INDUSTRY NEWS

Continued from Page 176

Workshop-Seminar, scheduled for the week of October 7th through 11th, 1963, in New York. The list includes: Stephen Karabournis of Robert H. Klinger Associates; Tak Koko and Frank McGovern of WABCTV (Film Dept.); Robert Yang and Les Appleton of Elektra Film productions;

Irving Ochman of Vision Associates; Fred De Geese and Edwin Ficker of Titra Sound Corporation; Anthony Tersini and Bill Henry of Tersini Film Editorial Service; Arthur Leigh and Stanley Butera of Cinema Scores; Jerry Forman of Allegro Film Productions; Marcel Brokman of Professional Film Services; Hoyt Griffith of Viteascope; Paul Falkenberg of Paul Falkenberg Films; Ken Grubel of Grumman Aviation and Mal Wittman.

Special guest speakers will include Maurice Levy of Eastern Effects; John Kowalik of Mevialah; Calvin M. Heichkin of Eastman Kodak; Irving Shish of Q.Q. Motion Picture Titles; Arnold Eagle of Arnold Eagle Productions and the New School of Social Research; and Jack Glenn of Jack Glenn, Inc. and the Institute of Film Techniques at C.C.N.Y.

QUESTIONS & ANSWERS

Continued from Page 308

printing track is recommended for quantity order economy, consistent quality, faster delivery, and accurate reproduction of the producer's mixed sound.

Q.—I am told that the 200mm, 250mm and 400mm Leica camera lenses can also be mounted on the Bolex H16 camera with the aid of a Leica adapter ring and tube. However, I recall reading somewhere that only lenses specifically designed for 16mm cameras should be used with them. In your opinion will use of 35mm still camera lenses on the Bolex H16 affect results in any way?—T. A. S., Green Bay, Wis.

A.—Leica lenses in a third mount can be used on 16mm CINEMAT cameras such as the Bolex H16 by means of the Leica adapter made by Pilsard, Inc. Leica lenses used on your camera should provide completely satisfactory results, especially since only the center portion of the field is used. The viewfinder on the camera should be set for the focal length of the Leica lens used. The focusing ring on the lens should be set for the subject-to-camera distance and the diaphragm then set in the normal manner according to your exposure meter reading.

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BEIL & HOWELL, Model "J" Menz printer with 200 watt high intensity lamp house, reflector, color gels, adapted for air, includes new printer supply. \$3,245.00. Cine Speed II with new 100' film chamber, dual film bases, case, all like new. \$995.00. 35mm Western Cine Automatic Splicer, new, with 1 year guarantee, list \$220.00, now \$119.00. 218MM "C" mount Knapik 7x7.8 lens, new, lists for \$400.00, tested \$179.00. Megamag Model 400, list \$1,725.00, excellent condition. \$995.00. Megamag 2:400 with flypage control, lists for \$1,242.00, excellent condition. \$645.00. TS-04AS sound projector, like new. \$312.00. Hacoil 8000000 sound projector. \$1,127.00. Aulcon Cine Vase W/4000 Polish conversion, case, amplifier, 1" lens, excellent. \$740.00. Bell & Howell 17 mm 75mm Angemag zoom lens, demon motor w/case. \$345.00. WESTERN CINE SERVICE, INC., 312 So. Pearl, Denver 8, Colorado.

TERMINATING complete 16mm & 35mm sound production facilities. Write or call: **MA-ART TV/PAF**, CAMERAS, DOLBY, new, ex. \$2,200.00, special \$975.00. **MAGNATRIC** 14mm DUBBER edge and center track, \$725.00. **Auticon** 35mm model 26 (lens) only. \$295.00. **Blount** 16mm camera, (CINEMA-RUN) CAMERETTE 14/35mm complete with sound blimp, cost over \$10,000.00, bargain. **Auticon** 35mm, Auticon 400, \$295.00. Many other items too numerous to mention. Write: **UNIVERSITY SUPPLIES**, 233 West Ohio Street, Chicago, Illinois, (312) 647-4468.

S. EW in R. **SQUASH** heads \$55.00, 2 KW A1R heads, \$45.00. 750 BA. Raylights with stands, \$47.50, 750 single broods with stands \$45.00. **Colman** 5' lit, \$100.00, 1/8 volt self mounted spot light for Mitchell stand only, \$225.00. **Conway** automatic dials, \$45.00, **Marshall** 26mm 400' magazines, \$60.00. **Beck** 4 x 5 background slide projector, \$450.00. **Beck** 9 x 12 background screen, \$100.00. J. **BLISS** CONNER, AISC, Blue Seal Sound Devices, P. O. Box 479, New Canaan, Conn.

REAL BUTS from one of the leading mail order camera stores for over 20 years. New **Greife** Galaxy deluxe sound projector, 16mm model, \$395.00. Used **Cine Kodak** Special 100' magazine, \$100.00. Used **Cine Kodak** Special 200' film magazines, \$390.00. Used **Beck** colorizer, \$20.00. **WESTEN S.** 800 feet roll, **Sonic** Barbara, California.

MAGVISA model LP (green model) has one optical head on picture side, plus one optical and one 16mm magnetic head. Also has provision for additional head. Complete with foot controls, amplifier, fuzing circuit, etc. Everything in excellent working order. Best offer: **BOGLI PRODUCTIONS, INC.**, 1028 33rd St NW, Washington 7 D.C.

TECCA M3 with 35mm, 50mm, 70mm, 125mm lenses, wide angle finder, w/cables, filters, Leica exposure meter and other accessories. Over \$400 value for only \$435. In mint condition, equal to new. Write for details. Box 1462, AMERICAN CINEMATOGRAPHER.

STUDIO & PRODUCTION EQUIP.

SHOOTING equipment for sale: 1 Cine 80W, 1 Cine 44415 5 KW, 13 Klugli 3444 2 KW, 3 mac. 3 KW, 1 Klugli 2 KW cine and 3 mac. 750 watt. Best lights, lens stands and dials. Lights will be sold for best offer: **RODEL PRODUCTIONS INC.**, 1828 20th St NW, Washington, D.C.

125MA (5 inch) 6/2 Schneider Xenon lens, coated, 3-stopped, in Arflex mount, equal to new for only \$275.00. **35MM** (1 inch) 6/2.3 Bausch & Lomb Bulbo lens, coated, in Mitchell mount, equal to new for only \$145.00. Torque motor for Axi 18 magazines only \$125.00. Box 1462, AMERICAN CINEMATOGRAPHER.

16MM NICO film processing reel complete with leader and tanks, \$145.00. Long closed about TV camera and Mural 12" monitor, demagnetizer. Originally \$795.00, tested \$395.00. **RONALD H. PLANT PRODUCTIONS**, Box 748, Redlands, Calif.

AURICON Cineplex converted to 400', Mitchell 400' mag, take up motor, 3 lens turret, one 35mm and one 100mm lens, amplifier, make, headpiece, scan door. Recently reconditioned. Everything for \$1100.00. **RONALD MACK**, 224 Aurora Hall, Univ. of Miami, Coral Gables, Fla.

SUPER 16mm lens, 25mm Bausch & Lomb lens in Mitchell 16mm Bausch & Lomb mount, \$150.00. "T" adapter 175mm Bausch & Lomb bulb in NCE housing "C" mount, \$85.00. **MICHAEL RATHKOPF**, 10 Overlook Ave., Little Falls, New Jersey.

16MM production camera in excellent condition. **Mosier Model 65** complete, viewfinder, sync motor, new 400' mag, new matte box, case, \$1275.00. **STUDIO DEUTON**, 18 95 211 P. Bouville 65, NY.

ARIBON CV 400', 8MM magazine, sync motor, Auricon variable area gate and slit, offer, miles in single case. All like new, \$1345.00. **REISNER**, 1417 Kalma Rd., Washington 1, D.C.

WALL CAMERA, 4 lenses and accessories. **CINE REX** with Comaflex equipment \$300.00. **MR. SCHALLERT** (evenings) 664 0548 or 664 4191.

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TWO 35MM SUPER new shutter mechanisms with magazines and pedestals, \$78.00 each. All for \$175.00. **RAULI ROSE**, Wrenn, Ind.

CINE VOICE 1" VA, turret, 3 lenses, zoom drive, two 400' 8MM mag., all A1, \$395.00. **FOSTER**, 1428 M. Street, Washington, D.C.

VARIO-SWITZER 18-85 zoom lens, C mount, new, \$345.00. **Carb. ANTON J. CHOLZ**, 225 Naples Terr., New York 43, N.Y.

BARGAINS precision lenses 18 & 35L, complete. Write for list. **PROFESSIONAL CINE PRODUCTS**, 2223 N. Prairie, Dallas, Texas.

LOW COST ADVERTISING is available in the Classified Advertising columns of **AMERICAN CINEMATOGRAPHER**. All ads cost 20¢ per word. Sell, come, buy.

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your production end struggle with old or used equipment when we can trade for cash at new equipment? Let us know what you have and what you need.

THE CAMERA MART, INC.

1843 Broadway PL 7-6777 New York 23, N.Y.

WANTED to buy all types of projection bulbs, spotlight bulbs. **ADVANCED SPOTLIGHT SERVICE**, Box 254, Passaic, N.J.

SERVICES AVAILABLE

CAMERAMAN—EDITOR Heavy experience directing inside research and development. Presently engaged in business and industrial film production. Desires challenging position with vigorous film organization, either commercial or college. Complete resume available. Box 1462, AMERICAN CINEMATOGRAPHER.

CAMERAMAN-PRODUCER

Comedian-producer, 16mm. Industrial films, wants free lance assignments to fill future gaps of local or hard to secure. This man has 20 years experience with films for blue chip companies. **ROBERT FISHER**, Grove St., Michigan.

JAPANESE English speaking director-camera operator for feature, TV, etc. **HAIRY AKAHARA**, 2-1303 Setagaya, Tokyo, Japan. Credits: "Around the World in 80 Days" (see last issue), "American TV News" (see American Cinematographer, March, 1967).

Continued on Next Page

BATES Ads are in *Spotlight* from 20¢ per word. Minimum ad, 20 lines. That or 1¢. **16mm** optical lenses (used) at word and advertiser's price. 40¢ per word. **Revised** (shorter) lines (2¢) will be *Spotlight* from, *March* or *April* 40¢-45¢ each.

25¢ per line. Best ads with reactions to new arrival in *Editorial* office. **AMERICAN CINEMATOGRAPHER**, P.O. Box 228, Wellespie 21 Calif. Please also let of month deadline date of ads.

Classified Ads

Continued from Preceding Page

SERVICES AVAILABLE

16MM director cameramen available independent basis, or will consider relocating for permanent positions in studio or repeat industrial film operations. 18 years experience all phases. Fully equipped with Arriflex, lighting and transportation. Highest references. See 1469, AMERICAN CINEMATOGRAPHER.

TITLE BY CINTITLE—16mm and 35mm service. Lowest reproduction costs. ASSOCIATED CINTITLE SERVICES, 13204 Shaver Street, Baldwin Park, California.

CAMERAMAN available for assignments including UNDERWATER. BOB CHIVERTON, 2525 N. Olsen Blvd., Fort Lauderdale, Fla.

EUROPEAN film assignments. Worldwide experience in documentary and television productions. WORLD ALIVE FILMS, Willemshavenweg 207, Amsterdam, Netherlands.

FILM ASSIGNMENTS wanted, Pacific Coast and Midwest Areas, for stock shots, process film, etc. Top Hollywood cinematographers and equipment available. WORLD WIDE FILMS, INC., 128 So. LaBelle Ave., Hollywood 48, Calif. Phone: WE 9-3358 and OL 3-5072.

BRAZILIAN English speaking production unit available for assignments in Brazil. Group, etc. 11 years experience, color B&W. RUCCANTINI, Ave. Ipiranga 1248, Sao Paulo.

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EUROPEAN assignments. THOMAS J. ROSE, 31 Avenue des Malines, Paris 17, France. In U.S.A., 76175 Hollywood Boulevard, Hollywood, California. In Canada: 3261 Fernside Hill, Montreal, P.Q.

FILM assignments, 16mm, Detroit area wants stock shots. Editing and titling. HOWARD TRUST, 10488 Somers, Oak Park 27, Mich. U 2-7874.

16mm FILM assignments—Chicago area, industrial, in-place. ALLETTE STUDIO FILM PRODUCTIONS, 1657 Grace St., Chicago 13, Illinois. RI 9-8413. Ask for Products.

SOUTHWESTERN U.S. assignments 16mm. Arriflex on desert photography, landscape and nature. WEST WIND PRODUCTIONS, P.O. Box 238, Azusa, Arizona.

WANTED

OUTSIDE salesmen must be experienced. Salary and liberal commission. Our employees know of this. Only top-notch men with good background in motion picture equipment sales will be considered. Los Angeles area. See 1464, AMERICAN CINEMATOGRAPHER.

NATIONALLY recognized television production company wants to buy 16mm aerial, color film, and travel film for use in nationally syndicated TV series. Color or black-and-white. Send letter describing your film to: Mr. Mike Zeldin, BAKER GRAY PRODUCTIONS, INC., 714 Harvard Avenue, New Orleans, Louisiana.

WANTED FOOTAGE: Modern 16mm color aerial or equal on people, places and general atmosphere, amateur or business, in Australia, Mexico, Finland, Brazil, France, England and Canada. Write Box 1471, AMERICAN CINEMATOGRAPHER.

USED 16mm Arriflex clamp and Houston Presses all metal tripod complete with head or comparable tripod. Good condition and price. Box 1470, AMERICAN CINEMATOGRAPHER.

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1782 N. Orange Dr.
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FILM PROCESSING EQUIPMENT COLOR

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